CENTROID POLYMER TECHNOLOGIES
ELASTOMERIC ACCESSORIES FOR

# LOW, MEDIUM, HIGH VOLTAGE CABLE, CONDUCTORS, INDOOR AND OUTDOOR TERMINATION & JOINTING KITS

CENTROID
POLYMER TECHNOLOGIES

www.centroidpolymer.com

# Chemistry between us

We are experts in the creation of high quality Silicone elastomers and Engineering plastics offering solutions for the most demanding markets.
We formulate, mix, mould, extrude and hand fabricate Silicone, Viton, Nitrile, FluroElastomers and High Performance Butyl rubber sealants for all Engineering Solutions.

We specialize in problem solving, whether your needs are small, medium or large.

## What we do, We do well.

## Polymer is our Business

- VMQ — Silicone
- FDA VMQ — Food Grade Silicone
- ECO — Epichlorohydrine
- HT ACM — High temperature polyacrylate
- Viton® FKM — Fluorocarbon
- PTFE — Polytetra fluoroethylene
- IIR — Butyl Rubber
- FVMQ — Flurosilicone
- Vamac® AEM — Ethylene Acrylate
- EU-AU — Polyurethane
- HT VMQ — High Temperature Silicone
- PH VMQ — Pharmaceutical grade silicone
- TPU — Thermoplastic Polyurethanes
- EVA — Ethylene vinyl Acetate
- EPDM — Ethylene Propylene Diene
- NR — Natural
- FR VMQ — Fire Retardant Silicone
- NBR — Nitrile
- TPE — Thermoplastic Elastomer

CENTROID POLYMER TECHNOLOGIES

Demand for electrical energy is growing worldwide. Whether produced by traditional fossil fuels, nuclear power plants or various sources of renewable energy, reliable and safe cables are more crucial than ever. Manufacturers of equipment for high-voltage current transmission and low and medium-voltage distribution are demanding safer, more durable, innovative and cost-effective solutions. Rubber accessories are increasingly the materials of choice for wire and cable accessories because they offer high mechanical and insulation properties, ensure heat and fire resistance and can be used for a wide range of cabling applications in various sectors: utilities, construction, railways, urban lighting, electric vehicles (EV) rapid charging stations, etc.

# OUR PRODUCT OFFERING

**MATERIAL CHOICE FOR ELASTOMERIC ACCESSORIES**

- LOW, MEDIUM, HIGH VOLTAGE ELECTRICAL
- ELECTRONICS & TELECOMMUNICATION ELASTOMER ACCESSORIES ELECTRICAL CABLE
- CONDUCTORS
- INDOOR & OUTDOOR JOINTING TERMINATION KITS

CENTROID POLYMER TECHNOLOGIES

Centroid Polymer Technologies has developed and continues to develop a versatile product range and portfolio of formulations for making elastomer Indoor & Outdoor Cable Joints and Terminations Accessories using different technologies and products that meet increasingly demanding technical and regulatory requirements.

# CERTIFICATE OF APPROVAL

CERTIFICATE

TÜV AUSTRIA

Management system as per ISO 45001:2018

CENTROID POLYMER TECHNOLOGIES

P-32(4), (5), Pearl Road, KINFRA IT Park, Kanjikode East P.O. , Palakkad - 678 621, Kerala, India

Manufacture and Supply of Rubber Seals, Profiles, Tubes, Hoses, Adhesive Tapes & PTFE Components

SAFETY

CERTIFICATE

The Certification Body of TÜV SÜD South Asia Private Limited certifies that

CENTROID POLYMER TECHNOLOGIES

P-32(4),(5), Pearl Road, KINFRA IT Park, Kanjikode East P.O. PALAKKAD KERALA – 678621, India

has implemented Quality Management System in accordance with ISO 9001:2015

for the scope of

Manufacture & Supply of Rubber Profiles, Tubes, Seals, Hoses, Adhesive Tapes and PTFE Components

The certificate is valid from 2023-02-14 until 2025-09-16

Certificate Registration No. 99 100 20200

Date of Initial certification: 2019-09-17

Issue Date: 2023-02-14 Rev. 00

ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ CERTIFICAT

QUALITY

CERTIFICATE

The Certification Body of TÜV SÜD South Asia Private Limited certifies that

CENTROID POLYMER TECHNOLOGIES

P-32(4),(5), Pearl Road, KINFRA IT Park, Kanjikode East P.O. PALAKKAD, KERALA – 678621, India

has implemented Environmental Management System in accordance with ISO 14001:2015

for the scope of

Manufacture & Supply of Rubber Profiles, Tubes, Seals, Hoses, Adhesive Tapes and PTFE Components

The certificate is valid from 2023-02-14 until 2026-02-13

Certificate Registration No. 99 104 01517

Date of Initial certification: 2023-02-14

Issue Date: 2023-02-14 Rev. 00

ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ СЕРТИФИКАТ ◆ CERTIFICAT

ENVIRONMENT

दिल्ली मेट्रो रेल कॉर्पोरेशन लि०

DELHI METRO RAIL CORPORATION LTD.

Date: 13.01.2023

Port Performance Certificate

PERFORMANCE

पावरग्रिड POWERGRID

MANUFACTURER APPROVAL VALIDITY EXTENSION

PRODUCT APPROVAL

# CPRI PERFORMANCE TEST RESULT

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

CPRI

Test Report Number: CPRIBLRCDDMATM/SC23T0164 Date: 19 October 2023

TEST RESULTS

**Power frequency voltage withstand test in air at 33 kV for 01 and 10 minutes:**

**Test arrangement:** Silicone insulation sleeve with press lock was inserted on a 750 mm long conductor, and self-fusing tape was wrapped over at center of the sleeve. 1" aluminum foil was wrapped over the silicone sleeve at center. Test voltage was applied between the conductor and grounded aluminum foil.

**Test parameter:**

| | | |
|---|---|---|
| Rate of rise of voltage | : | 1 kV/sec |
| Surrounding medium | : | In air at ambient temperature |
| Nominal size of the specimen | : | 3 mm nominal thickness, 700 mm length |
| Test voltage | : | 33 kV, 50 Hz |
| Test duration | : | 33 kV for 01 minute and 33 kV for 10 minutes |
| Number of specimens tested | : | One |

The average temperature and relative humidity was 28 ± 2 °C and 53 ± 2 % respectively during the test.

| Sl. No. | Test Conducted | Results |
|---|---|---|
| 1. | Voltage withstand test in air at 33 kV for 01 minute | Withstood, no dielectric breakdown of the sleeve observed |
| | Voltage withstand test in air at 33 kV for 10 minutes | Withstood, no dielectric breakdown of the sleeve observed |

**Conclusion:** Tested sample complies with customer requirement.

(Ashitha P.N.)
Test Engineer

CABLES & DIAGNOSTIC DIVISION
P.B.NO.8066, SADASHIVANAGAR, P.O
PROF SIR.C.V.RAMAN ROAD, BANGALORE - 560 080. INDIA
Tele: +91 (0) 80-2207 2333

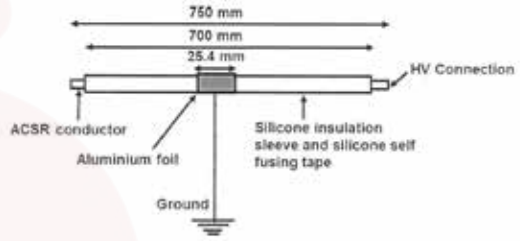


CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

CPRI

Test Report Number: CPRIBLRCDDMATM/SC23T0164 Date: 19 October 2023




Test Circuit Number: CPRIBLRCDDMATM/SC23T0164TCD01
Test setup for Power frequency voltage withstand test in air

(Ashitha P. N.)
Test Engineer

CENTROID
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# SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES

Centroid Polymer Technologies silicone conductor cover sleeves provide high-quality electrical insulation for substation leads and jumpers. These covers are made from a non-tracking silicone material that is suitable for medium-voltage outdoor environments.

## APPLICATIONS

Due to the physical, mechanical and thermal properties of silicon rubber, its advantages are many.

- High and low temperature stability.
- Inertness, that is no taste or smell.
- Translucent and easy to color.
- Wide hardness range.
- Chemical resistance.
- Weatherability.
- Sealing performance.
- Electrical properties.
- Compression set resistance.

## TYPES OF SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES

We at Centroid Polymer Technologies, manufacture four different types of Silicone Electrical Conductor Line Insulating Sleeves.

1 Silicone Electrical Conductor Line Insulating Sleeves Button Lock Type (SECLIS BLT).

2 Silicone Electrical Conductor Line Insulating Sleeves Press Lock Type (SECLIS PLT).

3 Silicone Electrical Conductor Line Insulating Sleeves Double Lock Type (SECLIS-DLT).

4 Silicone Electrical Conductor Line Insulating Sleeves Self Lock Type (SECLIS SLT).

CENTROID POLYMER TECHNOLOGIES

# SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES BUTTON LOCK TYPE (SECLIS BLT)

To construct more reliable MV and HV Compact Over Head Lines it is necessary to have enough clearance between the energized and earthed parts of the line. It could be done if conductors are covered. Using the present XLPE for Coating conductors is not reliable, due to the weight of the coating which is almost 50% of the weight of the conductor per metre.

It means that it could not be possible to be used on HV Overhead Lines. Utility companies should seek another material for this, like SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES BUTTON LOCK TYPE.

## APPLICATIONS

- Providing insulation for catenaries, droppers and conductors against contact from trees or wildlife.
- Provide protection for Railway covering electrical overhead equipment, elevated lines under overhead bridges, foot overhead bridges, road overhead bridges etc.

## FEATURES

- Silicone Rubber.
- Excellent arc resistance.
- Good dielectric strength.
- Good cold weather installation.
- Good conformability.
- Munsell Grey colour, Brick Red, Wide colour spectrum.
- Longitudinal Bias Cut.
- Increased creepage distance.
- Simple, quick, tool free and wrap around installation.
- Performance-Designed Material.
- Protect workers from accidental contact with energized components during line maintenance.
- Made of ozone/corona-resistant elastomer.
- Special formulation exhibits superior resistance to long-term aging/checking.

20+ years Service life

Excellent Uv resistance

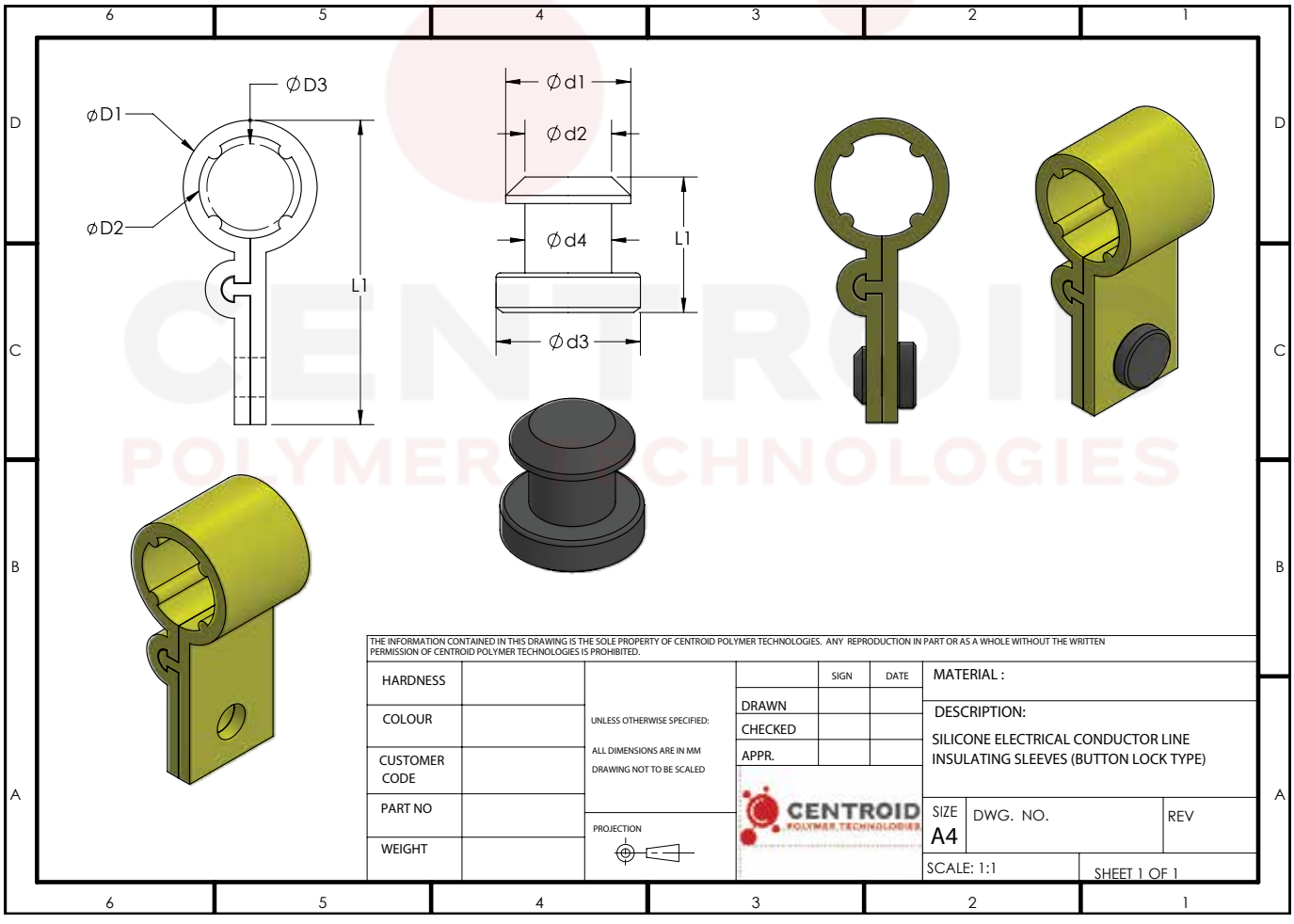
Voltage class: 10KV, 35KV,110KV, 220KV

Will retain its high-visibility colour

Oer excellent performance properties with ASTM Standard Specification D1048

Easy field installation.

Excellent ozone resistance



# TECHNICAL CHARACTERISTICS OF SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES-BUTTON LOCK TYPE

| SL NO | TEST DESCRIPTION | TEST METHODS | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| | **Physical Properties** | | | |
| 1 | Hardness | ASTM D 2240 | 65±5 Shore A | 72 |
| 2 | Tensile Strength | ASTM D 638 | >=7 mpa | 9 |
| 3 | Ultimate Elongation | ASTM D 638 | >200% | 420 |
| 4 | Abrasion Resistance | ASTM G 194 | 20% max thickness loss | Pass |
| 5 | Low Temperature Impact | ASTM D 746 | No cracking at 20deg C | Pass |
| 6 | Ultraviolet Resistance @ 500 hrs. Light Irradiance 0.68 W/m2.nm | ASTM D 4325 | No Cracking | Pass |
| | **Electrical Properties** | | | |
| 7 | Dielectric Strength | ASTM D 149 | >=10 kV/mm | 19kV/mm |
| 8 | Tracking and erosion Resistance | ASTM D2303 (Step Voltage Method @ 2.5 Kv) | No cracking or erosion to top surface or flame failure after 200 minutes | Pass |
| 9 | Voltage withstand test | 1>HT Test(Dry for 10 min) | 1>HT Test(Dry for 10 min) | Pass |
| | | 2>HT Test(Wet for 10min) | 2>HT Test(Wet for 10min) | Pass |
| | **Chemical Properties** | | | |
| 10 | Water Absorption at 336 hrs at 23 deg C | ASTM D 570 | 1 % max | Pass |
| 11 | Resistance to bird guano | Uric acid for 168 hrs @ 60 deg C | >= 7 mpa | Pass |
| 12 | Tensile Strength | | >100 % | Pass |
| 13 | Ultimate Elongation | | | Pass |
| 14 | Resistance to cable Grease | 168 hrs @ 60 deg C | >= 7 mpa | Pass |
| 15 | Tensile Strength | | >100 % | Pass |
| 16 | Ultimate Elongation | | | Pass |
| | **Thermal Properties** | | | |
| 17 | Accelerated Aging AT 168 hrs (150±2) deg C | ASTM D 2671 | | Pass |
| 18 | Tensile Strength | | >=7 mpa | Pass |
| 19 | Ultimate Elongation | | >100 % | Pass |
| 20 | Thermal Endurance | IEC | >105 deg C | Pass |

# SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES PRESS LOCK TYPE (SECLIS-PLT)

Silicone Electrical Conductor Line Insulating Sleeves Press Lock Type are covers made with a full-length extruded silicone rubber supplied in a reel in a flat format. The edge of the product is formed to lock together when installed on an electrical conductor.

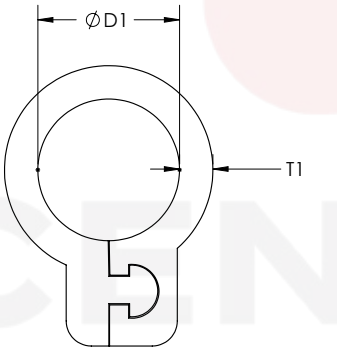
The covers are ordered in thickness appropriate to voltage class for use up to 220KV.

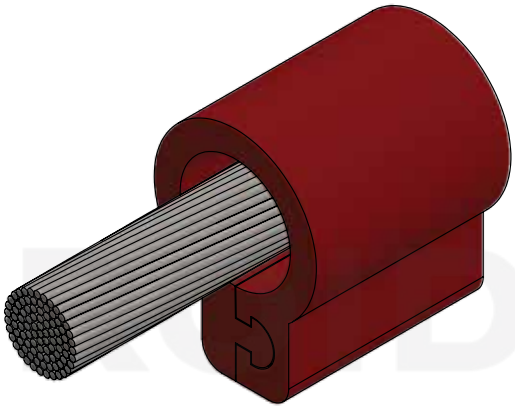
## APPLICATIONS

- The installation is simple and fast, and protection cable cover is widely used for insulation protection in bare lines of electrified railways and substations.
- Subway safety purpose (bare wire).
- Safety purpose at construction site(near power lines).
- Protect birds against electrocution & outage prevention.
- Providing insulation for catenaries, droppers and conductors against contact from trees or wildlife.

## FEATURES

- Made of silicone rubber.
- High resistance to aging and erosion.
- Providing insulation for catenaries, droppers and conductors against contact from trees or wildlife.
- Simple and fast installation, widely used in emergency repairs or temporary insulation protection of equipment.



THE LOCK TYPE REPRESENTED IN THE DRAWING AND PICTURE ARE FOR REFERENCE ONLY

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| | |
|---|---|
| HARDNESS | 70 ± 5 |
| COLOUR | GREY/BRICK RED |
| CUSTOMER CODE | |
| PART NAME | SECLIS PLT18 |
| WEIGHT | |

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN MM
DRAWING NOT TO BE SCALED
PROJECTION

| | SIGN | DATE |
|---|---|---|
| DRAWN | RAKESH | 30-12-22 |
| CHECKED | GOKUL | 30-12-22 |
| APPR. | Nikhil | |

CENTROID POLYMER TECHNOLOGIES

MATERIAL : SILICONE RUBBER

DESCRIPTION
SILICONE ELECTRICAL CONDUCTOR LINE INSULATION SLEEVE WITH PRESS LOCK

| SIZE | DWG. NO. | REV |
|---|---|---|
| A4 | DMRC-02 | |

SCALE: 1:1 SHEET 1 OF 1

# TECHNICAL CHARACTERISTICS OF SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES- PRESS LOCK TYPE

| SL NO | TEST DESCRIPTION | TEST STANDARDS | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| 1 | Material | ASTM D 2240 | Silicone Rubber insulation material with excellent electrical insulation / Dielectric strength | 72 |
| 2 | Before ageing | | | |
| 2a | Tensile strength (Min) | ASTM D412 or ASTM D 638 | 4 N/mm2 (Mpa) | 6.5 |
| 2b | Ultimate elongation(Min) | ASTM D412 or ASTM D 638 | 200% | 240 |
| 3 | After thermal ageing | | | |
| | Ageing conditions: | | for 168 hrs at 150 deg C | |
| 3a | Tensile Strength (Min) | ASTM D2671 | 3 N/mm^2 (Mpa) | 5.5 |
| 3b | Ultimate elongation (Min) | ASTM D2671 | 100% | 210 |
| 4 | Density/ Specific gravity | ASTM D792 | 1.1 - 1.60 g/cm3 | 1.49 |
| 5 | Low Temperature Flexibility | ASTM D2671 | No cracking of material @ -20 deg C fo 4 hrs | Pass |
| 6 | High Temperature Performance | ASTM D4388 | @external conditions<br>1) 90 deg C for 8 hrs (Continuous operation)<br>2) 130 deg C for 4 hrs (emergency overload)<br>3) 200 deg C for 2 hrs (Short Circuit)<br>Absence of any:<br>a) Physical deformation<br>b) Cracks or<br>c) Burning of the material | Pass |
| 7 | Water absorption (max) | ASTM D 570 | 0.5% @23 deg C for 24 hrs | 0.30% |
| 8 | Dielectric strength (Min) | ASTM D149 or ASTM D2671 | 10 kV/mm | 18 kV/mm |
| 9 | Volume Resistivity (Min) | ASTM D4325 or ASTM D2671 or ASTM D257 | 1 x 1010 Ohm-cm | 8x10^12 Ohm-cm |
| 10 | Tracking & Erosion resistance | ASTM D2303 | @conditions:<br>1 hr @ 2.5kV<br>1 hr @ 2.75kV<br>1 hr @ 3 kV<br>20 mins @ 3.25 kV<br>No tracking or erosion | <br>Pass<br>Pass<br>Pass<br>Pass<br> |
| 11 | Flammability | UL 94 | UL 94 V-0 certified | Pass |
| 12 | Service life | | >25 years | Pass |
| 13 | Hardness | ASTM D2240 | 60-75 (Shore A Type) | 70 |

# SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES SELF LOCK TYPE (SECLIS SLT)

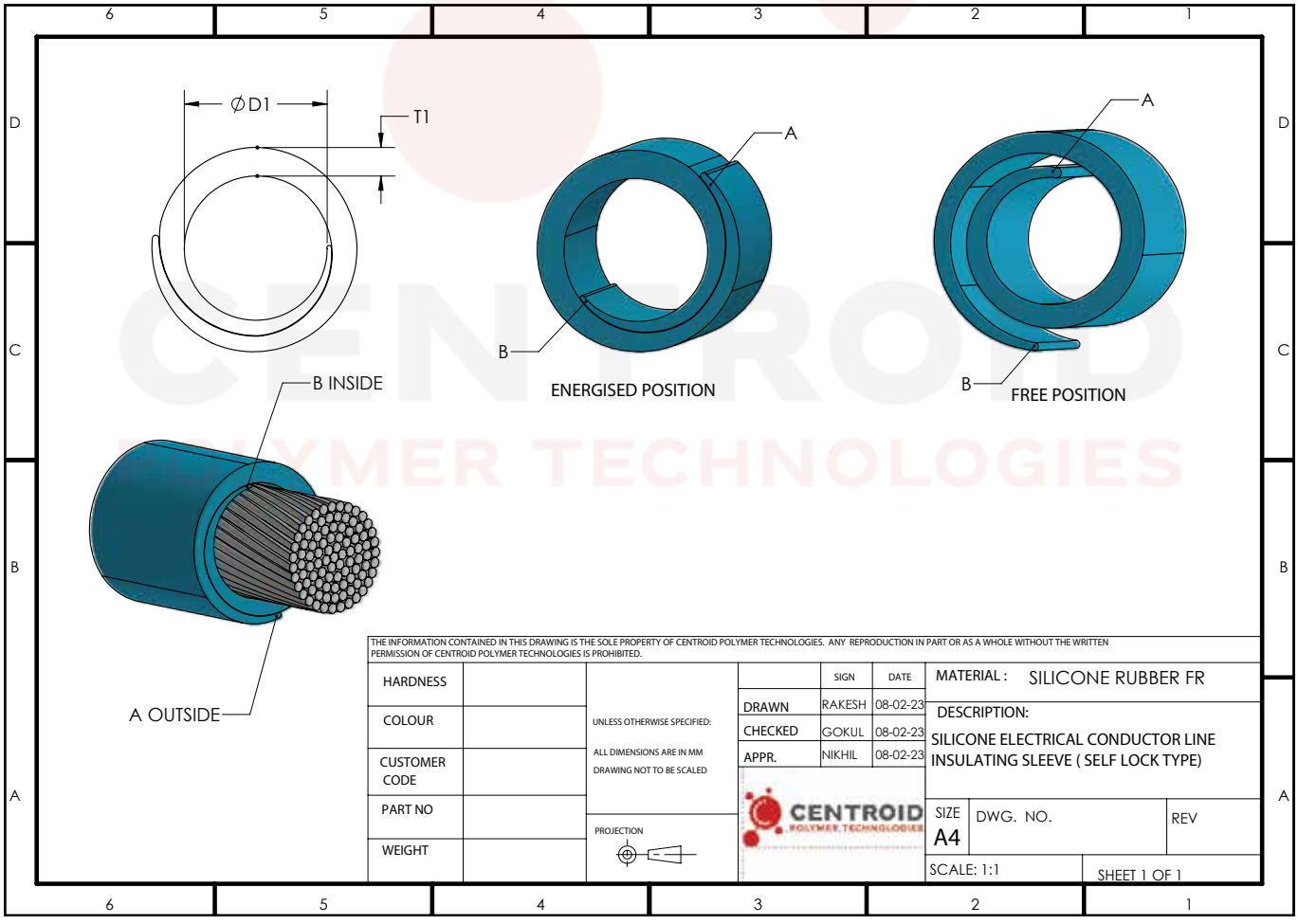
The Centroid Polymer Technologies Silicone Electrical conductor Line Insulating Sleeves-Self Lock Type series are extruded in Silicone Rubber and designed for field installation over bare conductors. These conductor covers are pre-slit with a generous material overlap. The covers are extruded with a tapered profile specifically designed to overlap onto itself and over the conductor further improving the dielectric properties and conductor protection.

SECLIS SLT covers provide electrical insulation and protection for phase to phase and phase to ground flashover that is caused by wildlife contact. SECLIS SLT are made from anti-tracking silicone rubber suitable for harsh outdoor environments. They provide reliable electrical insulation for overhead aerial bare conductors at road crossing, bridge crossing, railway crossing, highway crossing or substation leads and jumpers etc.

- SECLIS SLT are designed to protect energized conductors from flashovers due to contact from birds and animals and following articles in the wind and rain.
- SECLIS SLT are suitable for application for medium voltage power distribution system. The flexibility allows installation on tight bends.

# FEATURES

- Suitable for applications up to 220kV phase to ground.
- Six sizes available & will fit conductors up to 1.25” dia.
- Improved pliability at greater temperature ranges -40° C to 200° C.
- Excellent UV & Ozone resistance
- Unique design profile.
- Excellent conductor protection and fit.
- Easy slip on installation, no tool required.
- Flexibility of covers facilitate overhead installation on tight bends.
- Ideal for substation and distribution applications.



# TECHNICAL CHARACTERISTICS OF SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES-SELF LOCK TYPE

| SL NO | TEST DESCRIPTION | TEST METHODS | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| 1 | Type of Material | | Silicone Polymer | |
| 2 | Colour | | International Grey | |
| 3 | Product Thickness | Dimensional | 2.1 mm to 5.1mm | |
| 4 | Conductor Range/ Suitability | | Conductor from 50 to 500 sq.mm | |
| 5 | Tensile Strength | ASTM D412 | 5 Mpa (Min) | 6.5 |
| 6 | Ultimate elongation | ASTM D638 | 200% (Min) | 245 |
| 7 | Hardness | ASTM D2240 | 65±5 Shore A | 68 |
| 8 | Flammability | UL 94- V0 | Pass | Pass |
| 9 | Silicone content(%) | TGA ASTM D6370 | >30% | 38% |
| 10 | Di-Electric strength | ASTM D149 | 130 KV/Cm | 16 |
| 11 | Arc Resistance (Seconds) | ASTM D495 | >180 | Pass |
| 12 | Tracking and errotion | ASTM D2303 | No tracking, no erosion, no flame failure after | |
| | | | 2.50 kV for 1Hr,2.75 Kv for 1 Hr. | Pass |
| | | | 3.00 kV for 1Hr. 3.25 kV for 20 Min | Pass |

# SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES DOUBLE LOCK TYPE (SECLIS-DLT)

SECLIS-DLT are designed to increase system reliability by reducing wildlife related outages.

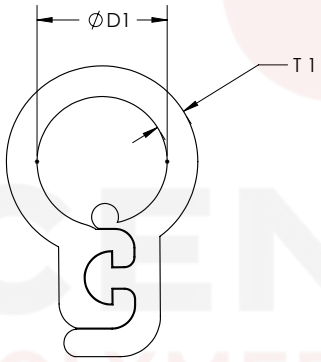
System interruptions and equipment failures caused by wildlife and incidental vegetation contact can be minimized by the use of conductor covers.

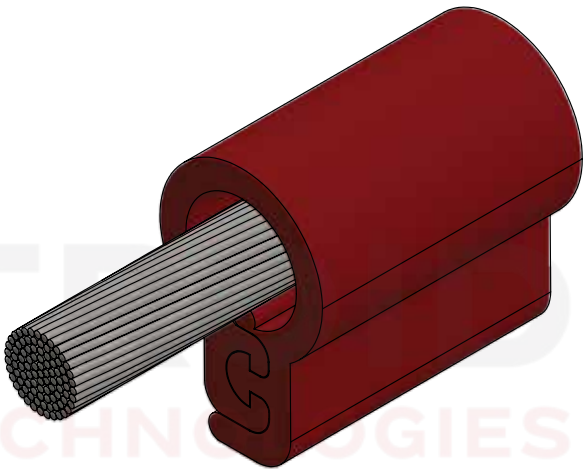
## APPLICATIONS

- Innovative product, easy to install over the existing Bare Conductors especially pertinent to isolate ACSR on the MV and HV overhead lines, with high dielectric strength - 22 kV/mm.
- The silicone cover could be also widely used in Railway companies as insulating the messenger (the carrying rope), when the contact network is passing through tunnels. Or it could be used to decrease the clearance and thus to light the poles.
- The installation of protection cable covers is simple and quick, and they are widely used for insulation protection in bare lines of electrified railroads and subways.
- Subway Safety Purpose (Barewire).
- Construction Safety Purpose (Near Power lines).
- Protect birds against electrocution and outage prevention.
- Easy assembly and disassembly, short-term repair and maintenance.
- You do not need special skills. Flexible, resistant to bending.

## ADVANTAGES

- Excellent Thermal conductivity of silicone rubber cover can effectively reduce the operating temperature of the busbar, increase the carrying capacity to solve the aging cracking due to temperature rise.
- Made of silicone rubber.
- High resistance to aging and erosion.
- Simple and fast installation, widely used in emergency repairs or temporary insulation protection of equipment.



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| | |
|---|---|
| HARDNESS | 70±5 |
| COLOUR | GREY/BRICK RED |
| CUSTOMER CODE | |
| PART NAME | SECLIS DPLT18 |
| WEIGHT | |

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN MM
DRAWING NOT TO BE SCALED
PROJECTION

| | SIGN | DATE |
|---|---|---|
| DRAWN | RAKESH | 30-12-22 |
| CHECKED | GOKUL | 30-12-22 |
| APPR. | | |

MATERIAL : SILICONE RUBBER

DESCRIPTION
SILICONE ELECTRICAL CONDUCTOR LINE INSULATION SLEEVE WITH DOUBLE PRESS LOCK

| SIZE | DWG NO | REV |
|---|---|---|
| A4 | DMRC-01 | |

SCALE: 1:1 SHEET 1 OF 1

# TECHNICAL CHARACTERISTICS OF SILICONE ELECTRICAL CONDUCTOR LINE INSULATING SLEEVES-DOUBLE LOCK TYPE

| SL NO | TEST DESCRIPTION | TEST METHODS | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| | **Physical Properties** | | | |
| 1 | Hardness | ASTM D 2240 | 65±5 Shore A | 70 |
| 2 | Tensile Strength | ASTM D 638 | >=7 mpa | 9 |
| 3 | Ultimate Elongation | ASTM D 638 | >200% | 420 |
| 4 | Abrasion Resistance | ASTM G 194 | 20% max thickness loss | Pass |
| 5 | Low Temperature Impact | ASTM D 746 | No cracking at 20deg C | Pass |
| 6 | Ultraviolet Resistance @ 500 hrs. Light Irradiance 0.68 W/m2.nm | ASTM D 4325 | No Cracking | Pass |
| | **Electrical Properties** | | | |
| 7 | Dielectric Strength | ASTM D 149 | >=10 kV/mm | 19kV/mm |
| 8 | Tracking and erosion Resistance | ASTM D2303 (Step Voltage Method @ 2.5 Kv) | No cracking or erosion to top surface or flame failure after 200 minutes | Pass |
| 9 | Voltage withstand test | 1>HT Test(Dry for 10 min) | 30 kV minimum ac (phase ground) | Pass |
| | | 2>HT Test(Wet for 10min) | 30 kV minimum ac (phase ground) | Pass |
| | **Chemical Properties** | | | |
| 10 | Water Absorption at 336 hrs at 23 deg C | ASTM D 570 | 1 % max | Pass |
| 11 | Resistance to bird guano | Uric acid for 168 hrs @ 60 deg C | >= 7 mpa | Pass |
| 12 | Tensile Strength | | >100 % | Pass |
| 13 | Ultimate Elongation | | | Pass |
| 14 | Resistance to cable Grease | 168 hrs @ 60 deg C | >= 7 mpa | Pass |
| 15 | Tensile Strength | | >100 % | Pass |
| 16 | Ultimate Elongation | | | Pass |
| | **Thermal Properties** | | | |
| 17 | Accelerated Aging AT 168 hrs (150±2) deg C | ASTM D 2671 | | Pass |
| 18 | Tensile Strength | | >=7 mpa | Pass |
| 19 | Ultimate Elongation | | >100 % | Pass |
| 20 | Thermal Endurance | IEC | >105 deg C | Pass |

# SELF-FUSING SILICONE TAPE

Self-fusing Silicone Tape is made of a specially formulated silicone rubber capable of fusing to itself to create a flexible, homogeneous barrier. The tape starts to tack within seconds, forms an airtight and watertight seal within minutes, and permanently fuses to itself within 24 hours. Insulation for electrical systems—Protection for motor and generator coils and leads without any residue left behind on removal.

- **Insulation—**Provides up to 8000 volts at 0.5mm thickness.
- **Harness wrapping and wire bundling—**Meets Class H insulation requirements. Easy application and removal.
- **Splicing, terminating, and bonding—**Ideal field repair system. Significantly easier and cleaner application than traditional tapes and potting compounds.

CENTROID POLYMER TECHNOLOGIES

## APPLICATIONS

- **Insulation for electrical systems—** Protection for motor and generator coils and leads without any residue left behind on removal.
- **Harness wrapping and wire bundling**—Meets Class H insulation requirements. Easy application and removal.
- **Splicing, terminating, and bonding—**ideal field repair system. Significantly easier and cleaner application than traditional tapes and potting compounds.
- **Aircraft applications—**Flame retardant versions available to secure insulation to hot air ducting.
- **Automotive applications—**Easily installed as a battery weather wrap to prevent corrosive build up on terminals.

## FEATURES

- Thermal Stabilty..... 356°F/180°C.
- Temperature Range..... 65°F to +500°F (-54°C to +260°C).
- Volume Resistivity..... 1013 ohm-cm min. (ASTM D257).
- Self-Adhesion ..... 2 p.p.i min. (3.5 N/cm) (AST-MD2148).
- Hardness..... 50±10 Shore A (ASTM D2240).
- Moisture Absorption..... 0.9% (46 hrs. in H2O @ 70°F).

# TECHNICAL CHARACTERISTICS OF SELF-FUSING SILICONE TAPE

| Sl No | TEST DESCRIPTION | TEST STANDARDS | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| 1 | Operating | Continuous | -40°C TO +240°C (-40°F to +464°F) | Pass |
| 2 | Temperature Range | Intermittent | -40°C TO +240°C (-40°F to +464°F) | Pass |
| 3 | Dielectic Strength | ASTM D-149 | >12kv/mm | 14kv/mm |
| 4 | Delectric Constant,1 KHZ | ASTM D-150 | <4 | 2.95 |
| 5 | Volume resistivity | ASTM D-257 | 3 x 1014 OHM/CM | 5X10 14 ohm/cm |
| 6 | Cold brittle point, Max | ASTM D-2137 | -40°C | -45 C |
| 7 | Water Absorption | FED,STD,601,METHOD 6251 | 3% MAX BY WEIGHT | Pass |
| 8 | Tensile Strength | ASTM D-412 | 7kg/cm2 MINIMUM | 7.5kg/cm2 |
| 9 | Ultimate elongation | ASTM D-412 | 300% MINIMUM | 325% |
| 10 | Tear Strength | ASTM D 624 | 14N/mm | 16 |
| 11 | Durometer Hardness | ASTM D 2240 | 50+/-5 Shore A(ROOM CURED 24 HOURS | 52 Shore A |

CENTROID POLYMER TECHNOLOGIES

# BLACK INSULATING SELF-AMALGAMATING MASTIC TAPE

Butyl Black Insulating Mastic used to fill the cable cores for insulation, sealing and waterproof performance. Suitable for use in 11KV, 25KV and 36KV joints and terminations.

Black insulating mastic is used in LV and MV terminations and joints to protect the heat shrink material by covering the sharp edges of metallic parts. It is also used for filling voids and acts as an environmental seal.

## APPLICATIONS

- Reinforcement in heat shrink sealed areas.
- Provides moisture, dust and corrosion protection.
- Water resistant sealing at cable entry points.
- Suitable for sealing insulating cables and splices in low, medium and high voltage

## FEATURES

- Easily moulded by hand to conform to irregular shapes even during low temperatures.
- Permanently elastic and resistant to aging.
- Perfect adhesion to metal and all types of cable insulations and jackets.
- Provides excellent moisture sealing.
- Resistant to salt water, ozone, oil and corrosive chemicals.

Centroid Polymer Technologies can manufacture and supply Black Self-amalgamating Mastic Tape for Electrical Insulation in various cut lengths and sizes:

| THICKNESS | WIDTH | LENGTH(ROLLS) | LENGTH(STRIPES) |
|---|---|---|---|
| 1 mm<br>1.5 mm<br>2 mm<br>3 mm | 12 mm<br>20 mm<br>25 mm | 0.3 m<br>upto<br>45 m | 0.25 m<br>upto<br>0.75 m |

These are supplied between 2 layers of silicon paper.

## TECHNICAL CHARACTERISTICS OF BLACK INSULATING SELF-AMALGAMATING MASTIC

| SLNO | TEST DESCRIPTION COLOR | TEST STANDARD VISUAL | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| | Size | | | |
| | Width | Dimensional | 10mm to 150mm | |
| | Thickness | Dimensional | 1 to 3 mm | |
| | Length | Dimensional | As per Requirement | |
| 1 | Softening Point | ASTM D-36 | 100 °C (min) | 110 C |
| 2 | Water absorption R.T. for 24 hrs. | | 0.5% (max) | 0.30% |
| 3 | Volume resistivity | ASTM D 1373 | 1x10^10 Ohm-cm (min) | 4x10^14 Ohm-cm |
| 4 | Needle penetration | ASTM D-5 | 70 to 130 Unit/10sec | 90 |
| 5 | Density | ASTM D 792 | 1.5 to 1.65 G/cc | 1.52 |
| 6 | Brittleness temperature | ASTM D 2137 | -30 °C (min) | Pass |
| 7 | Service Temp. Range | | (-)4.4 °C to 93.3 °C | Pass |
| 8 | Penetration 300 gram cone | ASTM D217 | 80 to 95 | 80 |
| 9 | Elongation | ASTM C908 | 400% min. | 500% |
| 10 | Adhesive Tensile Strength | ASTM C907 | 1.26 kg/cm^2 to 1.40 kg/cm^2 (min) | 1.50 kg/cm^2 |
| 11 | Peel Adhesion | ASTM D3330 | >0.6kg/cm2 | 0.8kg/cm2 |
| 12 | Water Penetration | ASTM W2140 | No water penetration | Pass |

# RED ANTI TRACKING SEALING MASTIC

This is used in MV terminations for providing sealing. The base material of the non-tracking sealant is thermally stabilized, blended rubber. The base rubber is mixed with chemical additives offering non-tracking and insulating properties.

The sealant is water resistant and has high adhesion property to connectors and cable components. It can be used for filling voids even for irregular shapes. The color of the non-tracking sealant is red.

## APPLICATIONS

- Used to fill the spacing between cable cores for insulation, sealing and waterproof performances.
- Suitable for use in 11KV, 25KV and 36KV joints and terminations
- To provide sealing and anti-tracking for power cable termination and joints for heat shrink and cold shrink technology.
- Also used for bonding and sealing for connectors of electrical equipment and heat shrink mould parts

## FEATURES

- Excellent sealing and waterproofing properties
- Anti -tracking, Anti -aging
- Wide range of service temperatures : -20°C to 100°C, Overload temperature 120°C max.
- Excellent self-sticking
- Easy installations: Self-fusing Visco -Elastic Property
- Standard color : Red

# TECHNICAL CHARACTERISTICS OF RED ANTI TRACKING SEALING MASTIC

| SLNO | TEST DESCRIPTION COLOR | TEST STANDARD VISUAL | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| | **Physical Properties** | | | |
| | Size | | | |
| | Width | Dimensional | 20-40mm | Custom Sizes available |
| | Thickness | Dimensional | 1-2mm | Custom Sizes available |
| | Length | Dimensional | As per Requirement | |
| 1 | Needle Penetration | ASTM D 217 | 50-100 unit | 70 |
| 2 | Softening point | ASTM D 36 | 90 deg C (min) | 98 |
| 3 | "Low Temp. Flexibility (4 hr at –20°C)" | ASTM C 765 | No crack | Pass |
| 4 | Physical Form | | In roll form and strip form with release paper on both sides | As per packing Standards |
| | **Mechanical Properties** | | | |
| 5 | Adhesive Tensile Strength | ASTM C 907 | 3 Kg / sq. cm^2 | 3.5 kg/cm.sq |
| 6 | Elongation / Stretch test | ASTM C 908 | Min elongation 300% | 500% |
| 7 | Tack Test | ASTM D 3121 | <18 cm | 12 |
| 8 | Peel Adhesion | ASTM D 3330 | >0.2kg/cm2 | 0.3kg/cm2 |
| | **Electrical Properties** | | | |
| 9 | Volume resistivity | ASTM D 257 | 1 x 10^12 ohm cm | 5x10^14 ohm cm |
| 10 | Dielectric const at 50 HZ, 500 V | ASTM D 150 | <4 | 2.8 |
| 11 | Dielectric Strength | ASTM D 149 | min 8/mm | 10kv/mm |
| | **Corrosion Resistance** | | | |
| 12 | 168 hr at 90°C on Al conductor | | No chemical interaction / corrosion. | Pass |

CENTROID POLYMER TECHNOLOGIES

# BUTYL MASTIC TAPE TELECOMMUNICATION WEATHER PROOFING KIT FOR CONNECTORS

This unique waterproofing tape for telecommunication, it consists of Butyl Rubber, with performance of adhesion, shape and is super waterproof. It is also resistant to corrosion for Copper and various cable sheathing materials. The tape is suitable for water seal with all kinds of telecommunication [equipment] and cable connectors rated at 90℃ with an emergency overload rating of 130℃.

## APPLICATIONS

- Antenna Connection Waterproof.
- RRU Connection Waterproof.
- Earth Wire connection Waterproof.
- Macro station and special application.

# TECHNICAL CHARACTERISTICS OF WEATHER PROOFING MASTIC TAPE

| SLNO | TEST DESCRIPTION COLOR | TEST STANDARD VISUAL | SPECIFICATIONS | OBSERVED VALUE |
|---|---|---|---|---|
| | Size | | | |
| | Width | Dimensional | 10mm to 150mm | |
| | Thickness | Dimensional | 1 to 3 mm | |
| | Length | Dimensional | As per Requirement | |
| 1 | Softening Point | ASTM D-36 | 100 °C (min) | 110 C |
| 2 | Water absorption R.T. for 24 hrs. | | 0.5% (max) | 0.25% |
| 3 | Needle penetration | ASTM D-5 | 70 to 130 Unit/10sec | 90 |
| 4 | Density | ASTM D 792 | 1.5 to 1.65 G/cc | 1.48 |
| 5 | Brittleness temperature | ASTM D 2137 | -30 °C (min) | Pass |
| 6 | Service Temp. Range | | (-)4.4 °C to 93.3 °C | Pass |
| 7 | Elongation | ASTM C908 | 500% min. | 600% |
| 8 | Adhesive Tensile Strength | ASTM C907 | 1.26 kg/cm^2 to 1.40 kg/cm^2 (min) | 1.50 kg/cm^2 |
| 9 | Peel Adhesion | ASTM D3330 | >0.5kg/cm2 | 0.7kg/cm2 |
| 10 | Water Penetration | ASTM W2140 | No water penetration | Pass |

# STRESS CONTROL MASTIC

Stress control mastic provide stress relief of the electrical field in all MV cables joints and terminations for power cable applications.

Stress control mastic equilibrates the electrical field and reduces the electrical stress. Stress control mastic is resistant to water humidity, and is used for filling voids and irregular shapes.

## APPLICATIONS

- Stress control mastic provides stress relief of the electrical field in all MV cables joints and terminations for power cable applications.
- The stress control mastic with excellent stress controlling and self-sticking properties makes it widely used in heat shrink and cold shrink technologies.
- Stress control mastic equilibrates the electrical field and reduces the electrical stress.
- Stress control mastic is resistant to water and humidity, filling voids and irregular shapes.

# TECHNICAL CHARACTERISTICS OF STRESS CONTROL MASTIC

| SLNO | TEST DESCRIPTION COLOR | TEST STANDARD VISUAL | SPECIFICATIONS YELLOW,BROWN | OBSERVED VALUE |
|---|---|---|---|---|
| | **Physical Properties** | | | |
| | Size | | | |
| | Width | Dimensional | 20-40mm | |
| | Thickness | Dimensional | 1 to 3mm | |
| | Length | Dimensional | As per Requirement | |
| 1 | Needle Penetration | ASTM D 217 | 25 unit (min) | 35 |
| 2 | Softening point | ASTM D 36 | 100 C (min) | 105C |
| 3 | "Low Temp. Flexibility (4 hr at –20°C)" | ASTM C 765 | No crack | Pass |
| 4 | Physical Form | | In roll form and strip form with release paper on both sides | |
| | **Mechanical Properties** | | | |
| 5 | Adhesive Tensile Strength | ASTM C 907 | 1.5 kg / cm^2 (min) | 1.8kg/cm2 |
| 6 | Elongation / Stretch test | ASTM C 908 | 400% min | 700% |
| 7 | Tack Test | ASTM D 3121 | <25 cm | 22 cm |
| 8 | Peel Strength | ASTM D 3330 | 0.1kg/cm2 min | 0.18kg/cm2 |
| | **Electrical Properties** | | | |
| 9 | Volume resistivity | ASTM D 257 | 1 x 10 9 ohm cm (min) | 2x 10 10 ohm cm |
| 10 | Dielectric const at 50 HZ, 500 V | ASTM D 150 | >15.0 (min) | 17 |
| 11 | Dielectric Strength | ASTM D 149 | 7 MV/m (min) | 8.5 |
| | **Corrosion Resistance** | | | |
| 12 | 168 hr at 90°C on Al conductor | | No chemical interac-tion / corrosion. | Pass |

CENTROID POLYMER TECHNOLOGIES

# SILICONE RUBBER BUSHING BOOT

Silicone rubber flexible insulating bushing boots are moulded parts applied over the connection between the cable lug and the inline and right-angled equipment bushings to improve phase-to-phase and phase-to-ground insulation. They are used in switchgear and transformer cable boxes where the air clearance is not sufficient for normal operation or to protect against flash-over due to rodents.

Our electrical bushing boot is manufactured from high-grade silicone with excellent non-tracking and erosion resistance. The boot is very flexible, and just one size covers right-angle or straight connections for cable sizes 35-400mm$^2$.

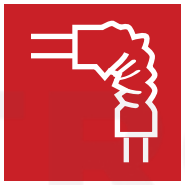
## FEATURES

- Made of silicone rubber, which is both flexible and insulating. Easy and simple installation. Removable and reinstallable, making maintenance simple.
- The flexible structure of the single design suits inline and right-angle applications.
- Suit bushing type 400/630A with a diameter of 70 mm.
- Collars can be used to accommodate smaller bushings: 250 A with a 31-45 mm diameter. One size can cover a large range.
- Conductor size: 35-400mm2.

# TECHNICAL INFORMATION

- Maximum system voltage 17.5 kV.
- Basic impulse level 95 kV.
- Collar size No. 1.
- Bushing diameter 31 – 45 mm.
- Cable cross section 35 – 400 mm2.

No need for specialised tools.



Suitable for a vertical or angled position.

No heating or filling is required.

The circuit may be energised immediately after completion of the termination.

CENTROID POLYMER TECHNOLOGIES

# UNSCREENED SILICONE BUSHINGS (RIGHT ANGLED BOOTS)

These are insulated T-shaped (right angled) pre-moulded un-screened silicone bushing boots suitable for use on 12kV Type 'C' 630A bushings. It has a very compact profile, making It is suitable for use in compact gas insulated secondary switchgear where the spacing between the bushings is significantly reduced.

The pre-moulded shape ensures optimal/full contact over the ensure Type "C" bushing profile thus improving its ability to eliminate unwanted leakage currents. The boots are easy to install and is designed for disconnection and reusability.

## APPLICATIONS

### 12kV only

- Compact Sf6 gas-insulated secondary switchgear (RMU's and Type B mini substations).
- Metal box filled with air.
- Distribution transformers.
- CT-VT metering units.
- They are used in switchgear and transformer cable boxes where the air clearances are insufficient for normal operation, or to protect against flashover due to rodents or high humidity.

## FEATURES

- Facilitates for direct voltage testing.
- Connection can be energized immediately after installation.
- Range taking capability.
- Not tracking elastomeric housing offers excellent erosion resistance and dielectric properties.
- No slip/slide off the Type 'C' bushings once installed.
- Compact profile provides for greater air clearance.
- Accommodates bulky torque shear lugs.

- Protection from short circuit due to intervention by reptiles, birds, animals.
- Ensures safety in densely populated localities.
- High electrical strength.
- Easy to install or remove as often as required.
- Economically viable solution for 11 kV and 33 kV.

## TECHNICAL CHARACTERISTICS OF UNSCREENED SILICONE BUSHINGS

| PROPERTIES | TEST METHODS | TYPICAL VALUE |
|---|---|---|
| Breakdown Strength | IEC 243 | ≥20kV/mm |
| Broken extension rate | ASTM D 2671 | ≥300% |
| Tensile Strength | ASTM D 2671 | ≥6MPa |
| Volume Conduct Rate | IEC 93 | ≥1014 ohm.m |

# OTHER PRODUCTS

## Silicone Sleeves & Silicone Chords

Silicone Sleeves & Chords of all sizes, colours are extruded. to a thickness of 1mm. They easily withstands 20 kV of voltage. Sizes starts from ID 0.5mm to ID 50 mm. Fire resistant grades are available. Custom compounds available with conductive, semi conductive to highly insulating property. Suitable in electrical insulation due to high dielectric strength, volume resistivity. Available in all colours and transparent. All sizes are available.

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# Silicone Gaskets, Wiring Harness Seals, Grommets, Caps, Plugs, Bundle Spacer, Suspension Insert etc.

High temperature weather resistant silicone seals outperform conventional EPDM, nitrile, neoprene gaskets in sealing and weatherproofing. Custom moulded silicone grommets with high heat and electrical resistance can be used in safe entry of cables and wires.
Low maintenance, long life, high flexibility. Can be used to attain IP grade sealing. Used in Control Panels.
All type of materials with UL 94 V-0, FV-0

**Tubing**
0.3mm -75mm inner diameter
0.2mm -25mm inner diameter

**Cord**
0.2mm -50mm diameter

**Keyhole Section**
3mm -40mm height
6mm -20mm base

**Autoclave Seal**
6mm -40mm height
6mm -20mm base

**U Channel**
0.5mm -30mm (slot)
Various heights &widhts

**e Section**
10mm -50mm Base
6mm -25mm height
Various Channel gaps

**L Section**
1mmx1mm to10mmx10mm section
Various height and base dimension

**H Section**
Various Channel gaps
From 12mm overall height
Various Width

**Doube P**
3mm dia bulbs to 12mm dia bulbs
Various widths to 50mm wide

**D Section**
6mm - 50mm base
6mm - 25mm height
Solid D Section also available

**Custom Design**
Custom channel seals are one of thousands available

**Channel Tube**
4mm- 20mm tube section
Various Channel Dimension from 1mm-6mm gap

**Flab Seal**
From 1mm-6mm channel gap
Various Flap dimension

Right angle Triangle section also available

**Triangular Section**
6.4mm-50mm height
6.4mm-50mm base

**Omega Tube Section**
4mm-20mm tube section
Various T section base dimension

**P tape**
3.5mm OD -33mm OD (Bulb)

**Vulcanised / Moulded Corners**
Corners with the best strength and appearance combinations

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# INDUSTRIAL STANDARDS

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